BROOKHAVEN NATIONAL LABORATORY

Work Permit # _____
Work Order # _____
Job# _____ **Activity#** _____

1. Work requester fills out this section. ☐ **Standing Work Permit**

Requester: Don Lynch	Date: 8/6/07	Ext.: 2253	Dept/Div/Group: PO/PHENIX
Other Contact person (if different from requester): Carter Biggs			Ext.: 7515
Work Control Coordinator: Don Lynch		Start Date: 8/6/07	Est. End Date: 11/1/07
Brief Description of Work: MuTr FEE Prototype Test			
Building: 1008	Room: IR	Equipment: MuTr North	Service Provider: PHENIX techs & MuTr experts

. WCC, Requester/Designee, Service Provider, and ES&H (as necessary) fill out this section or attach analysis

ES&H ANALYSIS				
Radiation Concerns	☒ None	☐ Activation	☐ Airborne	☐ Contamination	☐ Radiation
Radiation Generating Devices:	☐ Radiography	☐ Moisture Density Gauges	☐ Soil Density Gauges	☐ X-ray Equipment
☐ Special nuclear materials involved, notify Isotope Special Materials Group			☐ Fissionable materials involved, notify Laboratory Criticality Officer	
Safety Concerns	☐ None	☐ Ergonomics	☐ Transport of Haz/Rad Material	
☐ Adding/Removing Walls or Roofs	☒ Confined Space*	☐ Explosives	☐ Lead*	☐ Penetrating Fire Walls
	☐ Corrosive	☐ Flammable	☐ Magnetic Field*	☐ Pressurized Systems
☐ Asbestos*	☐ Cryogenic	☐ Fumes/Mist/Dust*	☐ Material Handling	☐ Rigging/Critical Lift
☐ Beryllium*	☐ Electrical	☐ Heat/Cold Stress	☐ Noise*	☐ Toxic Materials*
☐ Biohazard*	☐ Elevated Work*	☐ Hydraulic	☐ Non-ionizing Radiation*	☐ Vacuum
☐ Chemicals*	☐ Excavation	☐ Lasers*	☐ Oxygen Deficiency*	☐ Other
* Does this work require medical clearance or surveillance from the Occupational Medicine Clinic? ☐ Yes ☒ No				
Environmental Concerns		☒ None	☐ Work impacts Environmental Permit No.	
☐ Atmospheric Discharges (rad/non-rad)		☐ Land Use	☐ Soil Activation/contamination	☐ Waste-Mixed
☐ Chemical or Rad Material Storage or Use		☐ Liquid Discharges	☐ Waste-Clean	☐ Waste-Radioactive
☐ Cesspools (UIC)		☐ Oil/PCB Management	☐ Waste-Hazardous	☐ Waste-Regulated Medical
☐ High water/power consumption		☐ Spill potential	☐ Waste-Industrial	☐ Underground Duct/Piping
Waste disposition by:				☐ Other
Pollution Prevention (P2)/Waste Minimization Opportunity:		☒ None ☐ Yes		
FACILITY CONCERNS	☒ None			
☐ Access/Egress Limitations	☐ Electrical Noise	☐ Potential to Cause a False Alarm		☐ Vibrations
	☐ Impacts Facility Use Agreement		☐ Temperature Change	☐ Other
☐ Configuration Control	☐ Maintenance Work on Ventilation Systems		☐ Utility Interruptions	
WORK CONTROLS				
Work Practices				
☐ None	☐ Exhaust Ventilation	☒ Lockout/Tagout	☐ Spill Containment	☐ Security (see Instruction Sheet)
☒ Back-up Person/Watch	☐ HP Coverage	☐ Posting/Warning Signs	☐ Time Limitation	☐ Other
☐ Barricades	☐ IH Survey	☐ Scaffolding-requires inspection	☐ Warning Alarm (i.e. “high level”)	
Protective Equipment				
☐ None	☐ Ear Plugs	☐ Gloves	☐ Lab Coat	☒ Safety Glasses
☐ Coveralls	☐ Ear Muffs	☐ Goggles	☐ Respirator	☐ Safety Harness
☐ Disposable Clothing	☐ Face Shield	☐ Hard Hat	☐ Shoe Covers	☒ Safety Shoes ☐ Other
Permits Required (Permits must be valid when job is scheduled.)				
☐ None	☐ Cutting/Welding	☐ Impair Fire Protection Systems		
☐ Concrete/Masonry Penetration	☐ Digging/Core Drilling	☐ Rad Work Permit-RWP No		
☒ Confined Space Entry	☐ Electrical Working Hot	☐ Other		
Dosimetry/Monitoring				
☐ None	☐ Heat Stress Monitor	☐ Real Time Monitor	☐ TLD	
☐ Air Effluent	☐ Noise Survey/Dosimeter	☐ Self-reading Pencil Dosimeter	☐ Waste Characterization	
☐ Ground Water	☐ O_2/Combustible Gas	☐ Self-reading Digital Dosimeter	☒ Other Check O2 level prior to entry	
☐ Liquid Effluent	☐ Passive Vapor Monitor	☐ Sorbent Tube/Filter Pump		
Training Requirements (List below specific training requirements)				
Confined Space, CA –Collider User, PHENIX Awareness				
Based on analysis above, the Walkdown Team determines the risk, complexity, and coordination ratings below:			**If using the permit when all hazard ratings are low, only the following need to sign: (Although allowed, there is no need to use back of form)**	
ES&H Risk Level:	☐ Low	☒ Moderate ☐ High	WCC:	Date:
Complexity Level:	☒ Low	☐ Moderate ☐ High	Service Provider:	Date:
Work Coordination:	☒ Low	☐ Moderate ☐ High	Authorization to start	Date:
			(Departmental Sup/WCC/Designee)	

3. Both work requester and service provider contribute to work plan (use attachments for detailed plans)

Work Plan (procedures, timing, equipment, and personnel availability need to be addressed): See Attached backup Documentation
Special Working Conditions Required: None
Operational Limits Imposed: Modification work limited to lower octants easily reachable when standing on lower magnet superstructure.
Post Work Testing Required: No

Job Safety Analysis Required: ☐ Yes ☒ No	Walkdown Required: ☒ Yes ☐ No

Reviewed by: Primary Reviewer will determine the size of the review team and the other signatures required based on hazards and job complexity. Primary Reviewer signature means that the hazards and risks that could impact ES&H have been identified and will be controlled according to BNL requirements.

Title	Name (print)	Signature	Life #	Date
Primary Reviewer				
ES&H Professional				
Other				
Other C. Pearson				
Work Control Coordinator	Don Lynch		20146	
Service Provider				
	Review Done: ☐ in series	☐ team		

4. Job site personnel fill out this section.

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including any attachments).			
Job Supervisor:		Contractor Supervisor:	
Workers:	Life#:	Workers :	Life#:
Workers are encouraged to provide feedback on ES&H concerns or on ideas for improved job work flow. Use feedback form or space below.			

5. Departmental Job Supervisor, Work Control Coordinator/Designee

Conditions are appropriate to start work: (Permit has been reviewed, work controls are in place and site is ready for job.)			
Name:	Signature:	Life#:	Date:

6. Departmental Job Supervisor, Work Requester/Designee determines if Post Job Review is required. ☐ Yes ☐ No

Post Job Review (Fill in names of reviewers)			
Name:	Signature:	Life#:	Date:
Name:	Signature:	Life#:	Date:

7. Worker provides feedback.

Worker Feedback (use attached sheets as necessary)
a) WCM/WCC: Is any feedback required? ☐ Yes ☐ No

b) Workers: Are there better methods or safer ways to perform this job in the future? ☐ Yes ☐ No

8. Closeout: Work Control Coordinator (authorizing dept.) checks quality of completed permit and ensures the work site is left in an acceptable condition. (WCC can delegate clean up of work area to work supervisor)

Name:	Signature:	Life#:	Date:
Comments:			

Work plan Attachment **WP# _____**

MuTr FEE Prototype Test

INTRODUCTION

As a part of the PHENIX Muon Trigger Forward Upgrade, MuTr experts will be testing new prototype electronics during the 2007 summer shutdown beginning 8/6/07 and continuing until the end of Sep. 2007. This work will involve placing new electronics connected to existing MuTr FEE's instations 1 & 2 north.

Additional Details

Additional details are provide in the attached test plan.

Requirements

All MuTr and PHENIX personnel involved in this effort shall have current C-A User training and PHENIX Awareness training. In addition all personnel who will need to enter into the north Muon Magnet (MMN) shall have current confined space training.

The north and south Muon Magnets shall already be cleared for entry for concurrent MuTr work being performed this summer and all persons entering the MMN for this test shall follow the posted confined space procedures and signed the entry log each time they enter the MMN.

All electrical equipment, gas system requirements and mechanical installation involved in this test shall be reviewed by appropriate C-A safety personnel prior to commencement of these tests.

MuTR FEE Upgrade Summer Test Plan

RIKEN/RBRC

Itaru Nakagawa

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Itaru@bnl.gov

Material will be installed temporary and tested.

After test, they will be removed.

Schedule is not finalized yet. Need your input.

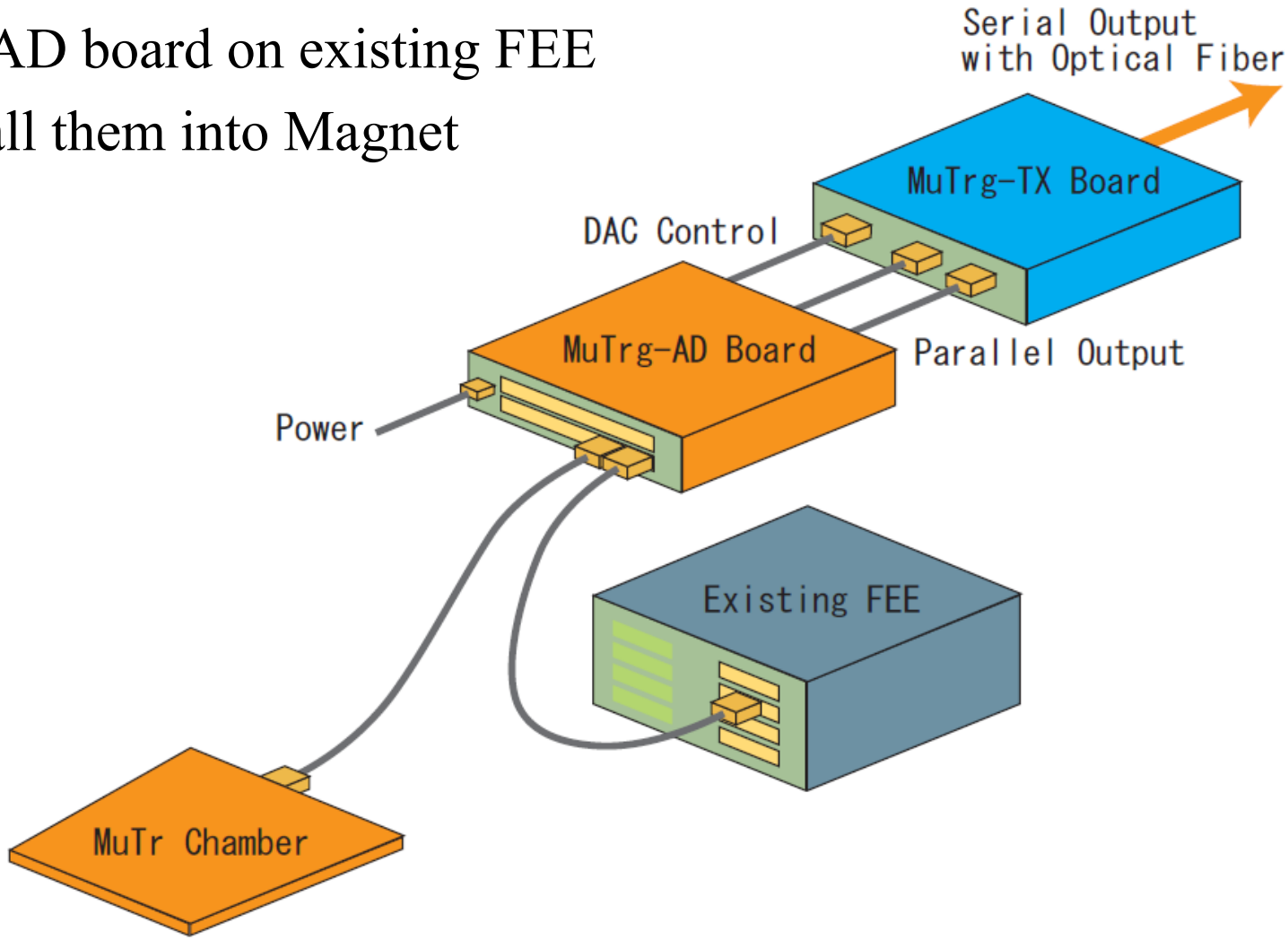
MuTrg-AD & TX Board Install

Signal split on MuTrg-AD Board backplane

For St.2,

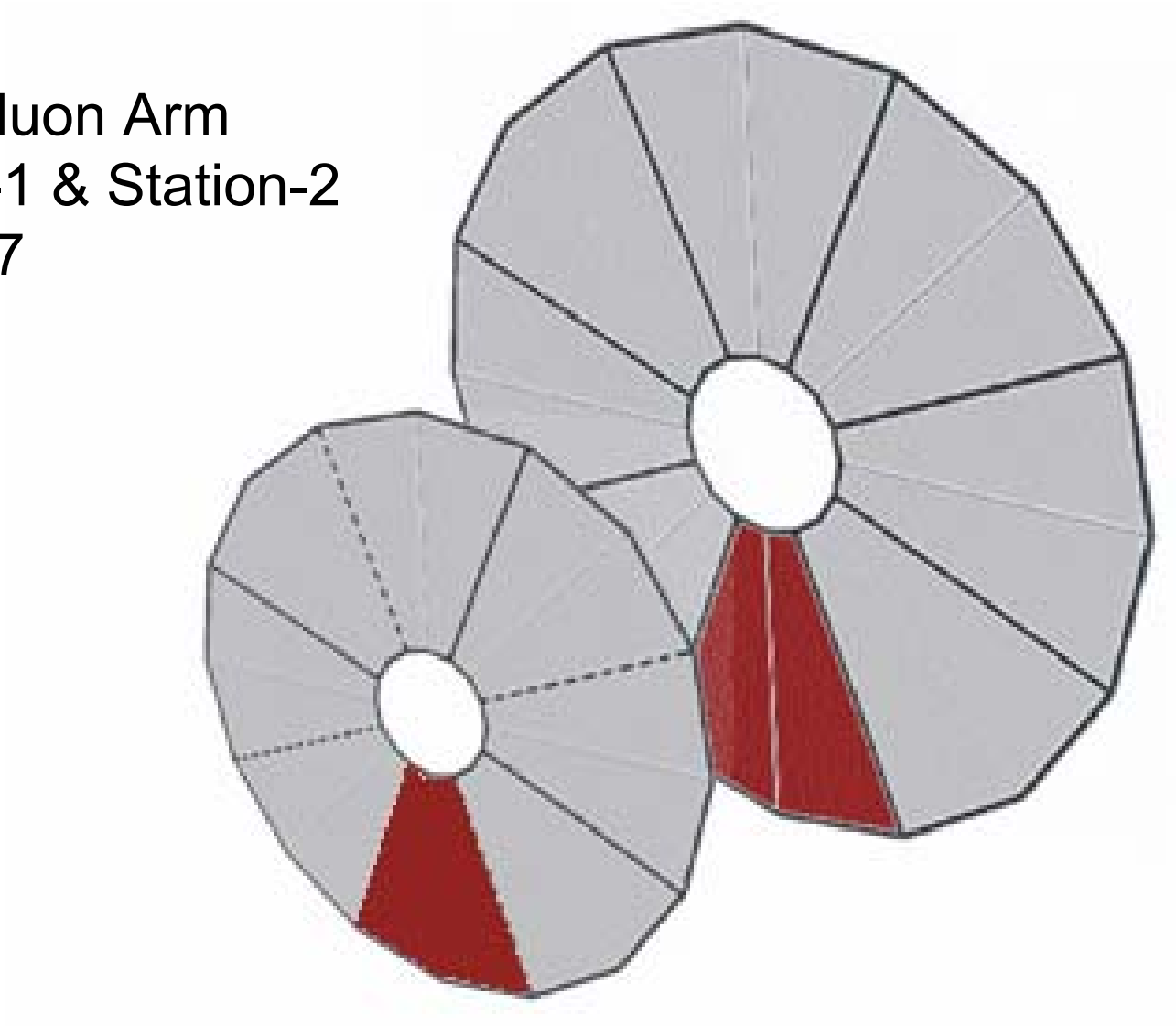
Put AD board on existing FEE

Install them into Magnet



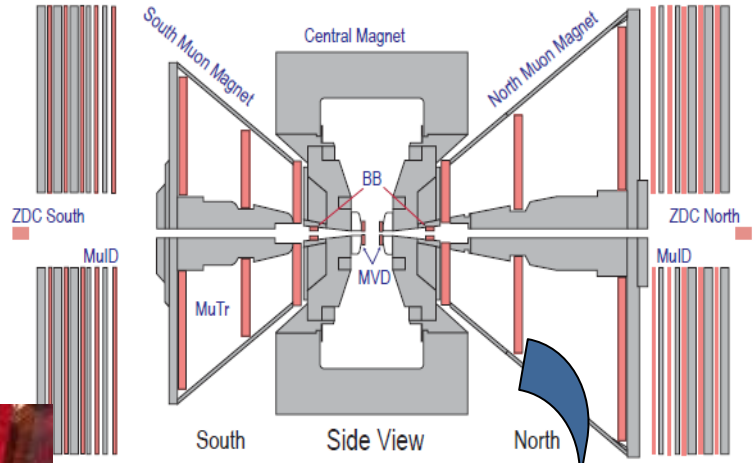
Where is it going?

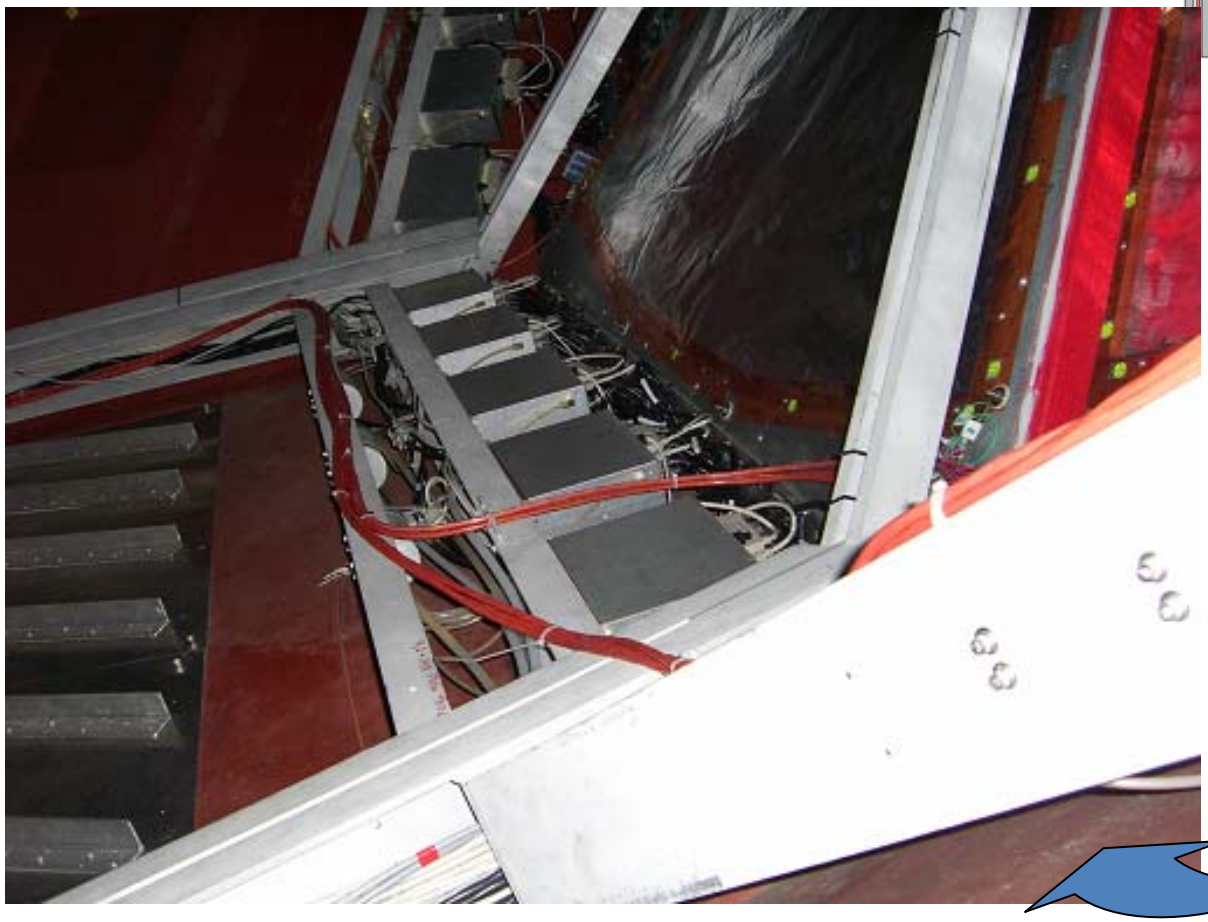
North Muon Arm
Station-1 & Station-2
Octant-7

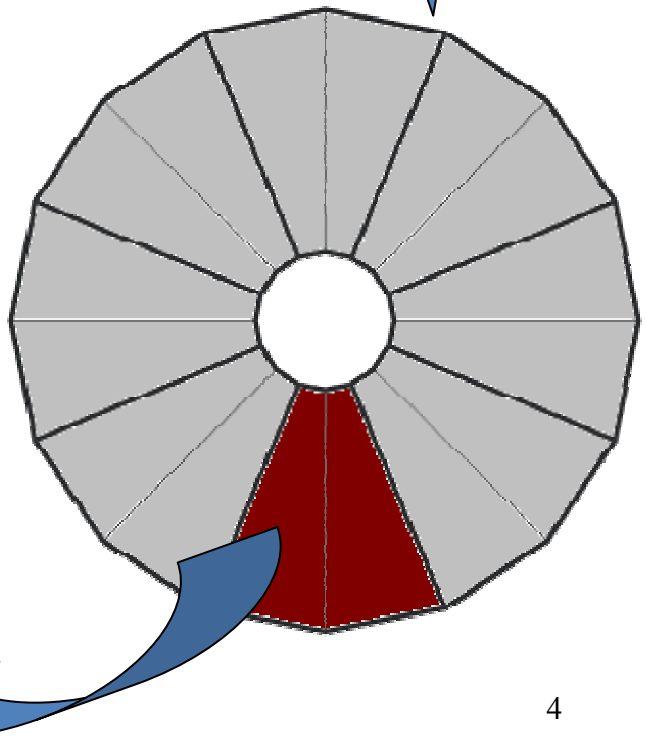


Station-2

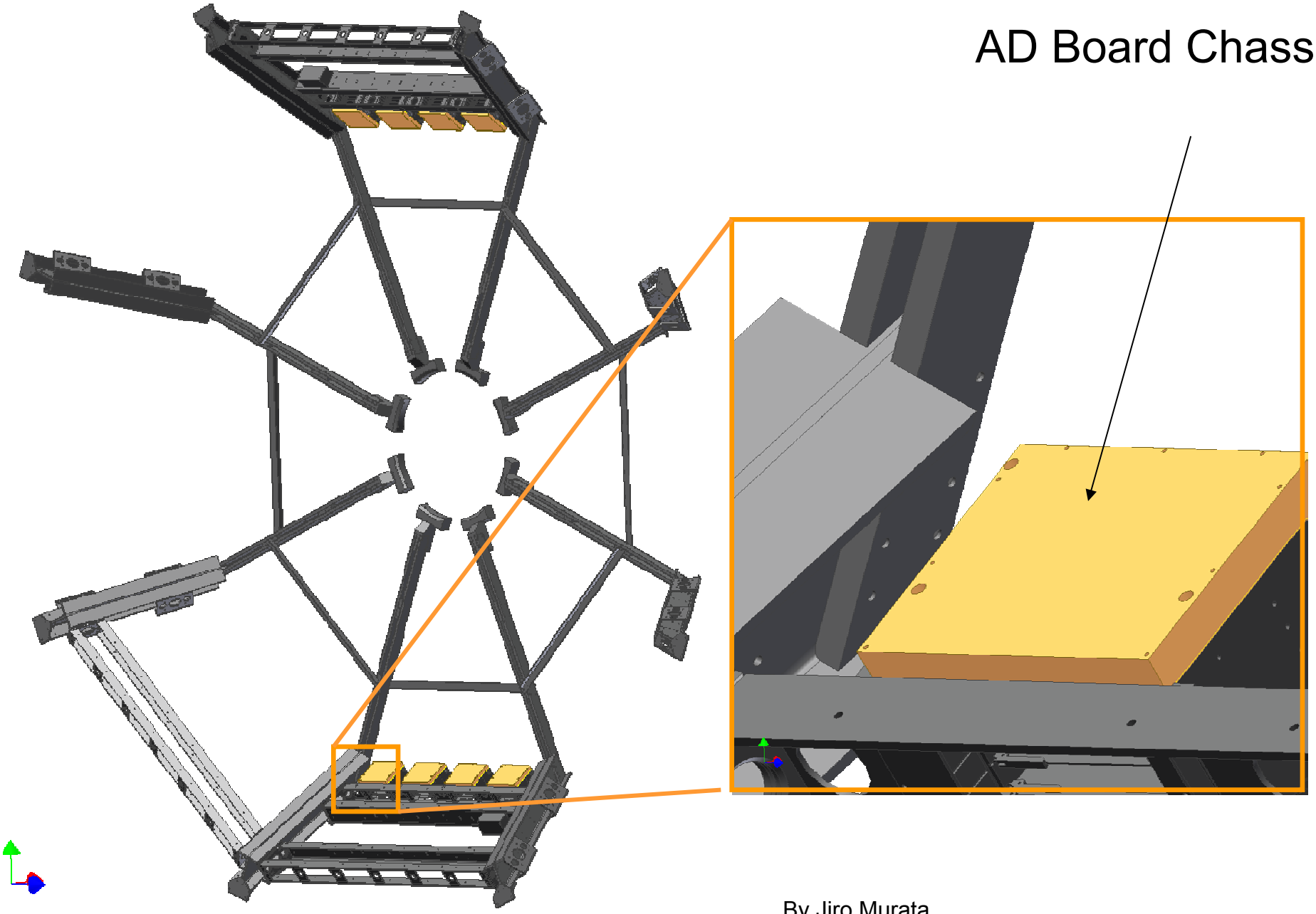
- 5 AD board Chassises
- 3 TX board Chassises







AD Board Chassis



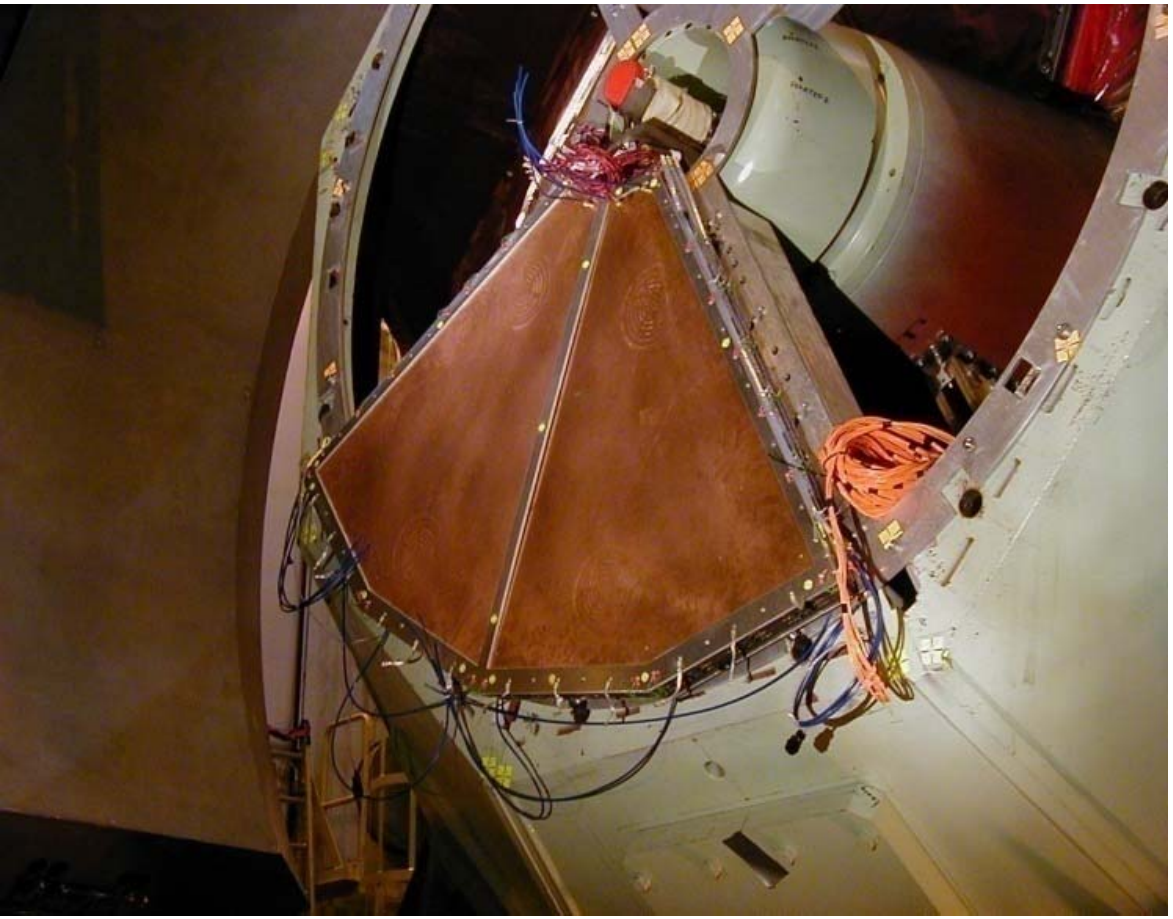
By Jiro Murata

Station-2
TX Board Chassises

Attach TX-Board Chassises

New Frame
Unistrat + C-cramp on existing frame

Station-1



3 AD-Board Chassises
2 TX-Board Chassises

Need to be accessible
to St-1during test period

Need Man Lift

No plan how to mount yet

Hardware Requirements

- MuID North + MuTR North (No Magnetic-field at all)
- Gas :
  - Phase-I : 8/14 - 8/23
    - MuID : CO_2
    - MuTR: Ar + CO2
  - Phase-II: 8/23 - 9/10
    - MuID : CO_2 + C_4H_{10} (recirculation mode)
    - MuTR: CF_4 + Ar + CO_2 (recirculation mode)
- Dry N_2: not much flow
  - Manifold + 1/4 inch tubes
- Cooling Water : not much flow
  - Manifold + 1/4 inch tubes
- Power :
  - Install 8 AD & 8 TX boards
    - 102W = 8 * 9.4W(AD) + 8 * 3.4W(TX)
  - Power from MuTr LV module
    - unused 12ch (7.5V * 4A = 30W/ch)
    - LV cable * 12 pairs. LV module->Octant.7 (st-1,st-2).

DAQ + Disk Space Requirement

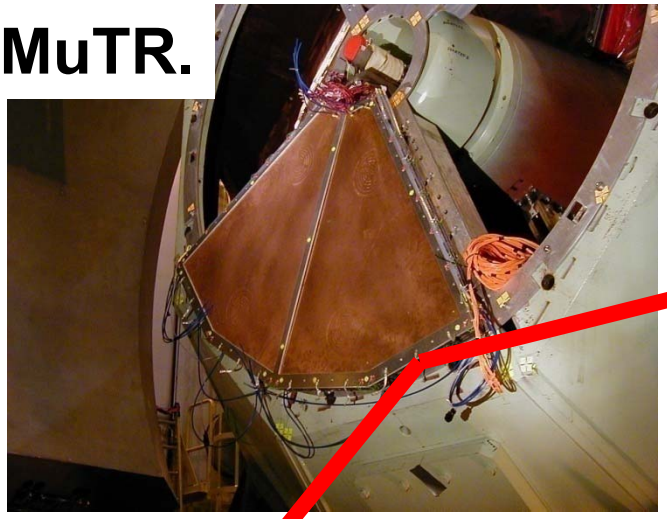
- MuID North + MuTR North.
- MuID-North 1D-Single Trigger
- New FEE signals ➔ MuID North (South) ROC ➔ DCM
- DAQ
- Disk space : 3~4 TB total

Schedule

- Aug.6 : Preparation for Installation
- Aug.13 : Start Installation
- Aug.16 : Debugging
- Aug.23 : Production data taking.
- Sept.10~20 : Finish data taking
- Sept.10~20 : Start Uninstall

Backup Slides

System overview



DATA

DCM

Trigger

GL1

AD

TX

MRG

96bit

Mu-Trigger
LL1

MuID LL1

Muon Arm

Counting House